

Claims

[1] An apparatus for controlling a switch of a satellite transponder for multibeam communication, which will be referred to as a switch controlling apparatus herein, comprising:

- an earth control station interfacing means for receiving and processing commands from an earth control station, collecting operation states of the switch controlling apparatus and reporting the operation states to the earth control station;
- a reference frequency generating means for generating a reference clock needed to operate the switch controlling apparatus and generating a reference frequency needed for the operation of the switch controlling apparatus based on the reference clock; and
- a switch controlling means for reading contents of a memory that stores a switching sequence periodically, detecting and correcting an error of the contents to generate a switch control signal, and transmitting the switch control signal to a radio frequency (RF) switch.

[2] The switch controlling apparatus as recited in claim 1, wherein the earth control station interfacing means includes:

- a controller for receiving control commands transmitted upwardly from the earth control station, analyzing the commands and transmitting the commands to corresponding parts of the switch controlling apparatus; and
- a monitoring unit for collecting operation states of modules in the switch controlling apparatus periodically and transmitting the operation states to the earth control station so that operation states of the switch controlling apparatus can be monitored in the earth control station.

[3] The switch controlling apparatus as recited in claim 1, wherein the reference frequency generating means includes:

- a reference clock generator which is formed of a voltage control crystal oscillator (VCXO) generating highly stable clocks and receives frequency control data from an earth station to thereby correct phase difference from clocks of the earth station; and
- a reference frequency generator for generating various synchronization signals needed to operate the switch controlling apparatus based on the clocks generated in the reference clock generator.

[4] The switch controlling apparatus as recited in claim 3, wherein the switch controlling means includes:

a memory interface unit for reading switching data stored in a duplexer and writing updated switching data transmitted upwardly from the earth station in the duplexer;

the duplexer for performing duplexing to operate a preparatory memory when a main memory is out of order during signal transmission/reception with the memory interface unit;

a switching signal processor for preventing an error in a switching signal to be transmitted to the RF switch;

an output controller for transmitting the switching signal to the RF switch;

an operation frequency generator for generating an operation time needed for the operation of the switch controlling apparatus based on the clock and synchronization signals generated in the reference frequency generating means; and

a memory controller for synchronizing data communication with the duplexer by controlling the operation of the memory interface unit.

[5] A method for controlling a switch which is applied to an apparatus for controlling a switch of a satellite transponder, which will be referred to as a switch controlling apparatus, the method which comprises the steps of:

- receiving and processing commands from an earth control station, collecting operation states of the switch controlling apparatus and reporting the operation states to the earth control station;
- generating a reference clock needed to operate the switch controlling apparatus and generating a reference frequency needed for the operation of the switch controlling apparatus based on the reference clock; and
- reading contents of a memory that stores a switching sequence periodically, detecting and correcting an error of the contents to generate a switch control signal, and transmitting the switch control signal to a radio frequency (RF) switch.